HONOLULU
LA JOLLA
MONTEREY
TIBURON

SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - FEBRUARY 1979

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NOAA/NMFS

TO OUR READERS:

In the future, to cancel delivery of the Southwest Fisheries Center (SWFC) Monthly Report, or to change the delivery address, please notify by writing:

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SOUTHWEST FISHERIES CENTER
LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - FEBRUARY 1979

STATUS OF PUBLICATIONS

Published

Lenarz, William H. and James R. Zweifel. 1978. A theoretical examination of some aspects of the interaction between longline and surface fisheries for yellowfin tuna, Thunnus albacares. Fishery Bulletin, U.S. 76(4):807-825.

This paper explores several aspects of a dual fishery (surface and longline) on yellowfin tuna, Thunnus albacares. The work is exploratory in nature and results, though indicative, are not conclusive for any specific fishery. Results indicate that the yield per recruit is higher for the longline fishery than for surface gear if all fish are available to both gears and higher for the combined gears than for either gear fishing alone. The effect of fishing by one gear on yield to the other gear and the effect of the fishery on stock fecundity is shown to be greater for the often assumed 1:1 sex ratio than for the ratios usually observed. A simulation model was used to examine the interrelations of pattern of movement of fish, pattern of recruitment, and fishing strategy. It was assumed that movements were random and recruitment occurred either only along the coast or throughout the fishing area. The results indicated that either of these patterns of recruitment could allow for increased catch as the surface fleet moved offshore. However, location or pattern of recruitment is shown to be important when measuring natural mortality and for examining the potential of a localized fishery, primarily on younger fish, relative to a fishery exploiting the full range of the stocks or to one taking primarily older fish. Tagging and fecundity studies are suggested for further investigation of the questions examined in this paper.

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

Nunes, P. and P.E. Benville, Jr. 1978. Acute toxicity of the water-soluble fraction of Cook Inlet crude oil to the Manila clam. Marine Pollution Bulletin, Vol. 9, pp. 324-331.

Clams from an area contaminated by crude oil exhibited greater resistance to the water-soluble fraction of Cook Inlet crude oil than specimens from a more pristine area. Behavior was altered below lethal levels, suggesting the possibility of using behavioral modifications as a concomitant criterion of toxicity with mortality. An increase in mortality with a longer exposure period and a significant rate of latent mortalities following the end of the 96-hour exposure period suggest that future bioassays with bivalves should be determined over a longer exposure period.

Whipple, J.A., T.G. Yocom, D.R. Smart, and M.H. Cohen. 1978. Effects of chronic concentrations of petroleum hydrocarbons on gonadal maturtion in starry flounder (Platichthys stellatus (Pallas)). The Proceedings of the Conference on Assessment of Ecological Impacts of Oil Spills, American Institute of Biological Sciences. pp. 757-806.

Adult starry flounder, during gonadal maturation, were continuously exposed to low concentrations (100 to 200 ppb) of the water-soluble fraction (WSF) of Cook Inlet crude oil for periods of 5, 7 and 21 days. Daily observations of behavior were made and fish were subsampled to determine effects on their gonads and other organs and to measure accumulations of low-boiling-point aromatic hydrocarbons in gonads and livers. Female flounders accumulated a mean concentration of 12.98 g/g (ppm) monocyclic, cyclohexane and dicyclic components in mature ovaries, 113 times the water column concentrations. Several changes in behavior and histological damage were attributed to chronic doses of WSF, including acceleration of egg maturation and abnormal and dead eggs in both immature and mature ovaries of exposed females, accelerated maturation of male testes, and extensive vacuole formation in livers.

If such effects also occur in the field at chronic levels, low concentrations of oil could have serious consequences on natural populations. If marine organisms prove generally to be more sensitive during their spawning season, fishery management decisions should consider timing of oil-related activities to adequately protect fishery resources.

Approved by Center Director

Husby, D.M. and G.R. Seckel. Parameterization and description of water structure at Ocean Weather Station V, 1966-71. For publication in NOAA Technical Report NMFS SSRF.

Lasker, Reuben. Factors contributing to variable recruitment of the northern anchovy (Engraulis mordax) in the California Current: contrasting years 1975 through 1978. For publication in the Proceedings of the ICES/Symposium on the Early Life History of Fish.

Parrish, R.H., C.S. Nelson and A. Bakun. Larval transport mechanisms and reproductive success of fishes in the California Current. For publication in the Fishery Bulletin, U.S.

Theilacker, Gail H. Comparative morphology of larval fishes, with special reference to the anchovy, Engraulis mordax: Live, laboratory-preserved, and field-collected. For publication in the Fishery Bulletin, U.S.

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Maro Reef Found Most Productive Spiny Lobster Fishing Ground; Work Continues on Lobster Growth and Fecundity

Richard N. Uchida, Leader of the Insular Resources Task, reported that researchers in the Task continued studies on various aspects of the biology of spiny lobsters, Panulirus marginatus, in the Northwestern Hawaiian Islands (NWHI). Uchida analyzed catch-effort data from five Townsend Cromwell cruises to the NWHI which indicated that among the 16 islands and banks investigated between October 1976 and March 1978, five showed good potential for commercial exploitation. Maro Reef, the most productive fishing ground uncovered thus far, produced 3,054 spiny lobsters (legals, shorts, and berried) in 588 trap-nights or an average of 5.19 lobsters per trap-night. Necker Island, which has received the most commercial fishing effort over the past 2 years, yielded 7,434 lobsters in 1,826 trap-nights or an average of 4.07 lobsters per trap-night. Catch rates at Raita Bank, Midway Islands, and Laysan Island were also relatively good, averaging 3.15, 2.09, and 1.97 lobsters per trap-night, respectively, during the period of the investigation.

Fishery Biologist James H. Uchiyama, assisted by Research Assistant Darryl T. Tagami, continued work on a study of the age and growth of the spiny lobster. Von Bertalanffy growth parameters were computed and a growth curve constructed for male spiny lobsters from around Oahu for comparison with similar data from lobsters taken around Necker Island in the NWHI. The results indicated that male spiny lobsters around Oahu had a slightly faster growth rate than those around Necker Island.

Research Assistant Victor A. Honda continued a study on the fecundity of spiny lobsters, experimenting on two methods to determine fecundity. In attempting the dry weight method, Honda encountered difficulty in separating the dried eggs from the fine hairs on the endopodite of the pleopods. The eggs were more easily separated from the hairs in the wet weight method. His results indicated that the egg mass of a female lobster 7.78 cm in carapace length contained 237,730 eggs and that of a 8.67 specimen, 242,887 eggs. The fecundity of these NWHI spiny lobsters fell within the range of that for spiny lobsters around Oahu.

Work Continues on NWHI Research Projects

Research Assistants Paul M. Shiota, Robert B. Moffitt, Bert S. Kikkawa, Robert L. Humphreys, Jr., and Glenn R. Higashi fabricated fish traps and shrimp pots for the forthcoming cruise of the Townsend Cromwell. Research Assistants Jose Enitan and Jeff Sampaga continued to read otoliths of pink snapper, Pristipomoides filamentosus, and processed otoliths of gindai, Rooseveltia brighami, and amberjack, Seriola dumerilii.

Research Assistant Darryl T. Tagami continued writing computer programs to summarize spiny lobster morphometric and distribution data. He also completed writing a computer program that will summarize catch and effort statistics by species for discrete statistical areas in the NWHI.

Regurgitated Material from Smaller Species of Seabirds Analyzed

Fishery Biologist Thomas S. Hida reported that work continued on a study of the food habits of seabirds based on the examination of regurgitated material. Samples of regurgitated material are being collected by scientists in the Fish and Wildlife Service from a wide area in the Pacific including the NWHI, the Line Islands, and other central Pacific islands. The regurgitated material processed during the month were from smaller species of seabirds, as shown below.

Bird Species	Food Items
Black noddy tern, Anous tenuirostris	Flyingfish, piha, goatfish, lizardfish, mahimahi, squid, penaeid and caridean shrimps, squirrelfish, stomatopod larvae
Christmas shearwater, Puffinus nativitatus	Squid, opelu
Sooty tern, Sterna fuscata	Squid, goatfish, snake mackerel, opelu
Brown noddy tern, Anous stolidus	Piha, opelu, snake mackerel, goatfish, damselfish, squid
Gray-backed tern, Sterna lunata	Flyingfish, cowfish, moth, grasshopper, Halobates, goatfish, puffer, spiny puffer, mahimahi, needlefish, crab, squid, filefish, triggerfish, rudderfish, juvenile billfish

NWHI Cooperative Study; Species Composition of Coral Communities Linked to Protection from Wave Action

Dr. Robert A. Skillman, Coordinator of the Cooperative Study for the Assessment of the Living Resources of the NWHI, reported that regular meetings of the participants are being held to: (1) review progress on various specific segments of the study, (2) assure thorough coverage of the ecosystem, and (3) resolve scheduling problems, particularly with regard to Townsend Cromwell cruises.

Study participant, Dr. Richard Grigg of the University of Hawaii Sea Grant Program, reported in February on the progress he and his assistants, Steven J. Dollar and Michael T. Palmgren, University of Hawaii graduate student, have made in his coral study. Two important findings were reported: (1) two species of corals, which are more typical of truly tropical habitats, were abundant or locally dominant in areas at French Frigate Shoals, and (2) the degree of protection from wave action may be the controlling factor in the existence of: (a) marked differences in the species composition of coral and algal communities of individual islands, and (b) an increase in species diversity from the southern to northern islands in the archipelago.

Significant progress was also made on the development of a NWHI ecosystem model. Biomass estimates for various resources near Laysan Island were assembled and sent to Dr. Taivo Laevastu of the Northwest and Alaska Fisheries Center (NWAFC) for model development and preliminary computer runs. While actually obtaining a computer run of the model turned out to be too optimistic, assembly of the data greatly facilitated progress in the development of the model. Dr. Jeffrey Polovina, Statistician, held discussions with Laevastu of the Honolulu Laboratory to learn more about the operational aspects of Laevastu's prognostic bulk biomass ecosystem model which is being evaluated for possible use in modeling the NWHI ecosystem. Laevastu also met with Polovina, Grigg, and Skillman to discuss specifics of the model including details of the model needing further refinement and data elements requiring further documentation.

In connection with the cruise schedule of the Townsend Cromwell, the unexpected forced lay-up of the Cromwell for repairs during most of November and December 1978 has necessitated some changes in plans. The cruise to study productivity in NWHI waters has been rescheduled for March and April 1979. Dr. Jed Hirota of University of Hawaii Sea Grant Program, is leading the productivity study.

Inadequate Data Available for Bottomfish Fishery Management Plan

Dr. Robert A. Skillman, Chairman of the Bottomfish Plan Development Team, reported on recent activities of the Team including two meetings held in January by the Team and a joint meeting with the Bottomfish Advisory Subpanel in February. The Team reviewed a report prepared by Stephen Ralston, University of Washington graduate student, under contract to the Western Pacific Regional Fishery Management Council.

At the meeting with the Advisory Subpanel, it was agreed that a Fishery Management Plan (FMP) for the fishery was needed, but a consensus in the urgency for preparing the FMP was lacking. The members of the Advisory Subpanel concurred with the concern of the Team about the quality of the available data on catch and particularly on effort, and several means for adjusting the data or obtaining better information were suggested. In light of the quality of the data, the Advisory Subpanel felt that it was premature for the Team to state that the major snapper stocks in the main Hawaiian Islands are at, or beyond the maximum sustained yield (MSY) levels.

Economic Studies on Hawaiian Fisheries Continue

Dr. Michael F. Adams, Industry Economist, Statistician Gary Kamer, Economist Linda Hudgins, and Research Assistant James Cooper continued work on economic studies and processing economic data related to the preparation of Fishery Management Plans (FMPs). Dr. Adams completed sections on economics for the spiny lobster and billfish-pelagic species FMPs.

Hudgins worked with the Hawaii Tuna Boat Owners Cooperative in collecting information on the disposition of catch between Hawaiian Tuna Packers and the Hawaii fresh fish market. Kamer and Cooper continued coding and summarizing data from the Hawaii fresh fish market.

Cumulative Landings of Skipjack Tuna Below Long-Term Average

The February 1979 Hawaii landings of skipjack tuna were estimated at 124.4 metric tons (MT), which is 35.2 MT above the February 1978 landings and 21.6 MT above the 1948-78 long-term average for February. The cumulative landings from January through February were estimated at 218.9 MT, which is 97.2 MT below the 1978 landings for the same period and 52.0 MT below the 1948-78 long-term average for the same period.

FISH-ENVIRONMENT INVESTIGATIONS (FEI)

Experiments Begun to Induce Spawning in Captive Tunas

Dr. Andrew E. Dizon, Leader of the Experimental Ecology of Tunas, reported that Dr. Calvin Kaya, visiting scientist from Montana State University, has begun work to evaluate the feasibility of inducing spawning in kawakawa, Euthynnus affinis, in captivity, and rearing the resulting larvae. The evaluation will be based on the results of preliminary trials with different hormone dosages and combinations, and on preliminary observations to determine whether suitable maintenance and handling techniques can be developed, and whether captive specimens will attain the prerequisite advanced stages of sexual maturation.

To date, Kaya has developed a technique to catch and immobilize tunas for biopsy procedures which will determine their stage of sexual development. The technique involves the use of a guiding barrier and a funneling device to entrap the fish in a plastic bag. One of two methods is used to immobilize the trapped fish: 1) quinaldine is used to anesthetize the fish; 2) the unanesthetized fish is tightly restrained between a cushion of foam rubber and a plastic covered solid material. The development of these techniques will make it possible to biopsy fish and administer hormone treatments without seriously injuring the fish.

Studies on other teleosts have indicated that the ova must attain certain critical sizes before the fish can be expected to respond to hormone treatments and release viable ova. Dr. Kaya believes the critical size for E. affinis ova is about 0.6 to 0.7 mm in diameter.

Examination of the gonads of wild E. affinis taken in Hawaiian waters indicates a trend towards increasing maturity in late January and mid-February. Presently 39 E. affinis taken in Hawaiian waters indicates a trend towards increasing maturity in late January and mid-February. Presently 39 E. affinis specimens are being maintained in two holding tanks at the Kewalo facility. All appear in good health and are taking food at the rate of about 15% of their body weight per day. If their gonadal development parallels that of wild fish, Kaya hope they all will attain advanced stages of gonadal development and be physiologically responsive to hormone treatments to induce spawning within the next few months. Gonadal biopsies will be continued to follow the sexual development of the fish during the next several months.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

LARVAL FISHES, COASTAL EAST PACIFIC

New Approach to Estimating Spawning Biomass Tested

Dr. John Hunter, Leader of the Larval Fishes, Coastal East Pacific Program, reports that the cruise of the charter vessel, Scorpius, was completed in February. This cruise was designed to estimate the abundance of anchovy eggs using sets of 8 vertical net tows per station. A total of 680 net tows was made, with a net of 25 centimeters in diameter.

The work was conducted in conjunction with the California Department of Fish and Game vessel, Alaska. The Alaska also took trawl samples of anchovy which will be used to estimate the catch fecundity and spawning frequency. These data will be combined with the estimates of egg abundance to estimate the spawning biomass of anchovy using equations derived by Statistician Keith Parker, as was reported in the October Monthly Report.

This work is the first test of Parker's approach to estimating spawning biomass of anchovy. The approach has a number of advantages over the past method: it is less costly; it will be more timely; the variance of the estimate will be better defined, and it may be more accurate.

One aspect of the new method is the use of small vertical net tows for egg sampling. Statistical theory for highly contagious populations such as eggs dictated that using many small samples for estimating egg abundance would be preferable to using fewer large samples such as those gathered by the standard CalCOFI olique net tow. In addition, because the small net collected fewer eggs, samples could be sorted much more rapidly and thereby sorting costs could be reduced. To date, these expectations appear to be correct. Sorting time has been about 20 minutes per sample, and the distribution of the numbers of eggs per sample within a set of 8 has been close to theoretical expectations.

Samples from Mixed Layer Reveal Patchy Distribution of Food Organisms

Dr. R. Owen, Oceanographer, reported that work on microstructure of food organisms suitable for larval anchovy progressed in February with completion of microscope counts on samples obtained in the upper mixed layer of the sea off Peru. The counts reveal a degree of variation of organisms and detritus concentrations that signify submeter scale patchiness in physically homogeneous layers. The patchiness indicates that vertical mixing rates even in this most labile zone are slow enough to permit aggregations of organisms and their products.

The microdistribution sampler is currently being modified by Owen's new student assistant, Lee Inness-Brown to permit quantitative microscale sampling of rarer but important larval fish food organisms such as copepod nauplii and copepodites. Inness-Brown designed a messenger-operated mechanism for simultaneously opening as many as 12 closely spaced plankton nets at depth, then closing them to prevent sampling from other than the desired strata.

Mathematical Model Describes Particulate Feeding by Fish

During February, Dr. Daniel Weihs, NOAA Research Associate, defined a mathematical model of particulate feeding by fishes, which will be used in Weihs' continuing studies on the energetic costs of hunting and feeding in fishes. The model describes the volume of water that is swallowed when the fish's jaws are opened. The prey has to be within this volume to be taken. The most important parameters affecting the shape of the swallowed volume are the size of the buccal cavity, the ratio of the speed of jaw opening to the forward swimming speed, and the rate of change of the forward swimming speeds while feeding. Weihs wrote a computer program package calculating the feeding volume shape, with graphical options including the trajectories of food particles at different initial positions relative to the fish mouth. The same model can be applied to calculate the volume sampled by pump-type samplers and to find avoidance distances.

Weihs also presented a series of seminars on his work at the Southwest Fisheries Center, Scripps Institution of Oceanography, Stanford University, Naval Postgraduate School in Monterey, and the University of Southern California.

ALBACORE FISHERIES INVESTIGATIONS

Utility of SEASAT Data to Fioshermen to be Evaluated

Dr. Michael Laurs, Leader of the Albacore Fisheries Program, attended a SEASAT-A satellite workshop at the Jet Propulsion Laboratory in Pasadena, California on February 7-8. At the workshop, results from the instrument assessment and verification efforts to date were presented. Considerable work remains to be done on refinement of the algorithms that convert satellite measurements to physical characteristics, such as sea surface temperature, and certain other evaluations, however, the data firmly support the success of the SEASAT-A mission during the approximately 3-month period the satellite was in operation.

Recently the La Jolla Laboratory received funding from NASA to conduct a SEASAT demonstration experiment involving the U.S. tropical and albacore tuna fisheries. Laurs and Oceanographer Richard Evans are making modifications to the initial proposal, necessary because of the premature failure of the satellite. The experiment will essentially consist of an evaluation of a distribution system which will disseminate oceanographic data gathered by satellites and other means to U.S. tuna fishermen, as well as an evaluation of the utility of SEASAT measurements to U.S. tuna fishermen and fishery scientists through case studies.

1979 Cooperative Research with American Fishermen's Research Foundation Approved

Proposals for cooperative research between the American Fishermen's Research Foundation (AFRF) and the NMFS were approved at the February 22 meeting of the AFRF's Board of Directors. The cooperative studies approved for 1979 include: 1) charter of a small baitboat for tagging off southern and central California in order to study migration of the "southern" group of albacore; 2) use of the chartered baitboat for a one-week period to conduct albacore sonic-tracking experiments; 3) charter of a jig-vessel for fish scouting and tagging in waters offshore the Pacific Northwest out to about longitude 150° W; and 4) tagging by U.S. jigboats planning to fish in the western North Pacific, northwest of Midway Island.

At the same meeting, Dr. Laurs, Leader of the Albacore Fisheries Program, presented a briefing on the results of the joint NMFS/AFRF albacore research conducted during 1978.

Manuscript Describing Albacore Fishing Completed

Biological Technician R. Dotson has completed a draft of a manuscript dealing with the equipment and methods used by the U.S. West Coast albacore fishermen. The report contains descriptions of radio and navigation equipment, refrigeration systems, fishing equipment used on jigboats and baitboats. Various fishing techniques used by jig and bait fishermen are also described, including the following: finding schools of albacore with sonar, locating and working temperature fronts, jigging maneuvers, and chumming and bait fishing. The manuscript will update the descriptions of albacore bait fishing and trolling written by Godsil (1938) and Scofield (1956), respectively.

Student Intern Assists in Processing Data

Christopher Sibley, geography major at San Diego State University, is working with the Albacore Fisheries Investigations in a student internship program for 12 hours a week during the spring semester. Sibley is providing assistance to Laurs and Nishimoto in processing albacore tagging data and catch per unit effort, and drawing temperature-salinity diagrams from the EASTROPAC data files.

Computer Programs Adapted to Produce CalCOFI Atlas

Oceanographers R. Lynn and K. Bliss have been working with Meteorologist L. Eber to adapt Eber's CalCOFI computer programs to produce contoured oceanographic sections. The seasonal means of temperature, salinity, oxygen, density and oxygen saturation, versus depth will be generated and plotted for the eight cardinal CalCOFI data lines. These sections will form the basis for a CalCOFI atlas.

Eber has produced one atlas of CalCOFI ocean data time series at selected stations with these programs, and has made changes to use the programs for oceanographic sections. Additional changes have improved the computation of smooth contours. Bliss, using the programs, has made trial runs to select letter/number size, and other parameters.

Retirement of Computer Necessitates Conversion of Programming

The computer center at University of California, San Diego, is retiring one of its major computers, the CDC3600 by mid-summer. It will be necessary to convert CDC programming and all data tapes to formats compatible with the Burroughs 6500. Oceanographer K. Bliss is developing conversion routines to recopy the numerous STD data tapes for use on the Burroughs 6500. The conversion includes all final data tapes for the EASTROPAC cruises from 1967-68 and the entire series of albacore/oceanograhy cruises. Bliss is also converting the STD processing and analysis programs.

MULTISPECIES TAXONOMY

Gut Contents of Larval Fishes Analyzed

Fishery Biologist Barbara Sumida MacCall has begun an analysis of the gut contents of larval fishes in the CalCOFI region, one aspect of research directed toward understanding the ecological relationships of larval fishes and their prey species. The most abundant and economically important species will be studied initially. Dr. A. Fleminger of Scripps Institution of Oceanography is providing guidance with copepod identification.

White Croaker Larvae Raised

In connection with the continuing attempt to identify previously unidentified larvae in CalCOFI samples, the white croaker, Genyonemus lineatus, has been reared through to metamorphosis by John Butler, assisted by the other members of the Multispecies Taxonomy Program. The eggs were collected on January 9 and survived to February 27.

MULTISPECIES, COASTAL EAST PACIFIC (CalCOFI)

U.S., Soviets Embark on Tenth Year of Cooperative Fisheries Surveys off California Coast

As part of continuing cooperative fishery research efforts between the U.S. and the U.S.S.R. now in its tenth year, the Soviet research vessel, Tikhookeanski based in Vladivostok, arrived in Long Beach harbor on February 5, took aboard two SWFC scientists and plankton sampling gear, and departed Long Beach February 9 for a 30-day survey cruise. The two researchers, Fishery Biologist Robert Counts and Biological Technician William Flerx, assisted their Soviet counterparts on the Tikhookeanski in gathering data on the abundance of Pacific whiting and anchovy eggs and larvae. The area surveyed included the ocean from off San Francisco south to Punta Eugenia, Baja California, Mexico and extended seaward to the 200-mile limit.

The 1979 cruise marked a decade of cooperation in fisheries research between the Southwest Fisheries Center and the Pacific Research Institute of Marine Fisheries and Oceanography (TINRO) in Vladivostok which operates the Tikhookeanski. The cooperative research program benefits both countries: data from the cruise contribute to U.S. population estimates for anchovy, which is an important commercial catch, and for the Pacific whiting, which is the target species of a developing domestic fishery in the Pacific Northwest: the Soviets also use these data to measure the abundance of the whiting stocks that they exploit off Oregon and Washington.

Researchers on board the 275-foot Tikhookeanski sampled the ocean's waters, towing a fine-meshed nylon plankton net 200 meters beneath the sea surface. The resulting sample of fish eggs, fish larvae and invertebrate organisms collected by the net will be divided, with half going to Soviets and half to scientists at the Southwest Fisheries Center. The plankton samples will be sorted by technicians ashore and precise counts made of all fish eggs and larvae captured. Using these counts fishery biologists can then estimate populations of fish species that spawn in the surveyed area, primarily anchovy and whiting, during the winter months.

The whiting, a member of the cod family, which Soviet fishing vessels catch off the Oregon and Washington coasts in the summer, migrate south to spawn off southern California and Baja California in the winter. The cooperative survey provides a measure of the abundance of the whiting resource prior to the beginning of the fishing season, thus helping to protect this resource against overexploitation.

The year's cruise will also be an integral part of a 5-month survey conducted by the National Marine Fisheries Service in the California Department of Fish and Game to estimate the abundance of northern anchovy.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Second Draft of Jack Mackerel Plan Completed; Modifications Requested in Anchovy Plan Amendments

A second draft of the jack mackerel Fishery Management Plan (FMP) was completed, printed, and distributed to interested parties. The Pacific Fishery Management Council (PFMC) will decide whether to go to the public hearing process with the Plan during its meeting in Eureka on March 8 and 9.

At the PFMC's February meeting, instead of voting to incorporate the proposed anchovy plan amendments into the Plan, the Council asked for further modifications. In order to make the Plan into a multi-year Plan, the procedure for determining the expected domestic annual harvest of anchovies will be expressed in a formula which can be applied by the Secretary of Commerce. Dr. Daniel Huppert, Leader of the Commerical and Recreational Fisheries Research for Management Program, has prepared a draft procedure which will be reviewed by the Advisory Subpanel and the Council in March.

Shortbelly Rockfish Taken on U.S.-Spanish Cooperative Squid Resource Cruise

The SWFC, in cooperation with the Spanish Institute for Fisheries Investigations (Instituto de Investigaciones Pesqueras, IIP), initiated a survey of the squid resource off the California coast, using the Spanish fisheries vessel, Freire-Lopez, a 54-meter stern trawler built in 1978. The basic objectives of the cooperative survey were: (1) survey coastal California waters from the Mexican border to the Oregon border outside 3 miles for distribution and abundance of cephalopods, particularly Loligo opalescens; (2) determine the effectiveness of various fishing gear including pelagic, semi-pelagic, and bottom trawls, and measure potential catch per haul through experimental fishing in selected areas; (3) measure by-catch of trawl hauls for quantity of fish caught, species and size composition; and (4) acquaint U.S. fishing industry and fishery scientists with the modern Spanish squid fishing technique.

Two Spanish scientists from IIP, Dr. Angel Guerra and Sr. German Perez Gandaras, arrived one week prior to the arrival of the vessel to prepare cruise plans. A genral planning meeting was attended by the two Spanish scientists, Gary Stauffer (SWFC, La Jolla), Sus Kato (SWFC, Tiburon), Geoff Moser (SWFC, La Jolla), Ray Ally (California Department of Fish and Game (CF&G) Long Beach), Jim Hardwick (CF&G Monterey) and Matt May (San Pedro fisherman). Survey areas, catch sampling procedures and data records were set up and detailed cruise announcement was prepared. The vessel arrived in San Diego on February 14 and departed on March 16.

Sus Kato, Geoff Moser and Matt May accompanied the first leg of the survey during which 21 trawl stations were occupied. Though only a few squid were caught, Sebastes jordani, shortbelly rockfish, a species targeted for fishery development studies at the Tiburon Laboratory, were prevalent in most of the trawl hauls. Because of the unavailability of squid, the southern California segment of the survey was shortened to one week.

The vessel departed San Pedro on February 24 to survey the coastal areas between Pt. Conception and Eureka. Bruce Wyatt (Sea Grant Marine Advisor out of Santa Rosa) and Jim Fermo (fisherman from Ft. Bragg) are accompanying the vessel on the second leg of the survey, which is scheduled to end March 9. At the end of the cruise, participating scientists will meet to prepare the final cruise report and draft a paper for Marine Fisheries Review. Dr. Gary Stauffer, Fishery Biologist, served as coordinator of the cruise.

1979 Mini CalCOFI Survey Cruises Underway

Three of the five proposed egg and larva cruises for the 1979 mini-CalCOFI survey for estimating the anchovy spawning biomass estimate are underway or completed. Samples from the first cruise aboard the E. B. Scripps, which was completed in January, have been sorted. Anchovy larvae were present in more stations than in January 1978. Spawning was occuring a little further offshore.

The second cruise aboard the Russian research vessel, Tikhookeanskiy, is just about completed. Fishery Biologist R. Counts and Biological Technician W. Flerx are scheduled to disembark on March 5 in Long Beach. The NOAA ship, Discoverer, began its cruise on February 24. The Discoverer will occupy southern stations off Mexico, and will terminate its survey in San Francisco where Chief Scientist Paul Smith and Larry Eber will disembark and return to San Diego. The remaining two cruises aboard the Jordan are scheduled for mid-March, mid-April and the month of May. The spawning biomass estimate for the central subpopulation of northern anchovy will be completed in June to be announced by the Southwest Regional Office in July.

Improvements Made in Processing Anchovy Data

Computer Programmer Joe Caruso revised the Anchovy Data Base portion of the Aerial Marine Resources Monitoring System. This system processes data gathered by aerial fish spotter pilots off Caliornia and north western Baja California.

Following Caruso's revisions, a report was generated which gave a breakdown of tonnages and sightings of anchovies, by block and day or night, for the areas around San Miguel, Anacapa and Santa Barbara Islands. An ocean block is an 8-mile by 10-mile area of ocean, 10` in latitude, 10` in longitude. The time period requested was the 1st and 2nd quarters of 1968-1977 inclusive. The program produced statistics for each year of interest as well as a summary for all years.

The figure shows the summary statistics for the first quarter of the entire 10 years for all pilots, day flights only. Any block which had a zero tonnage of sighting report was left blank.

AERIAL MARINE RESOURCES MONITORING SYSTEM

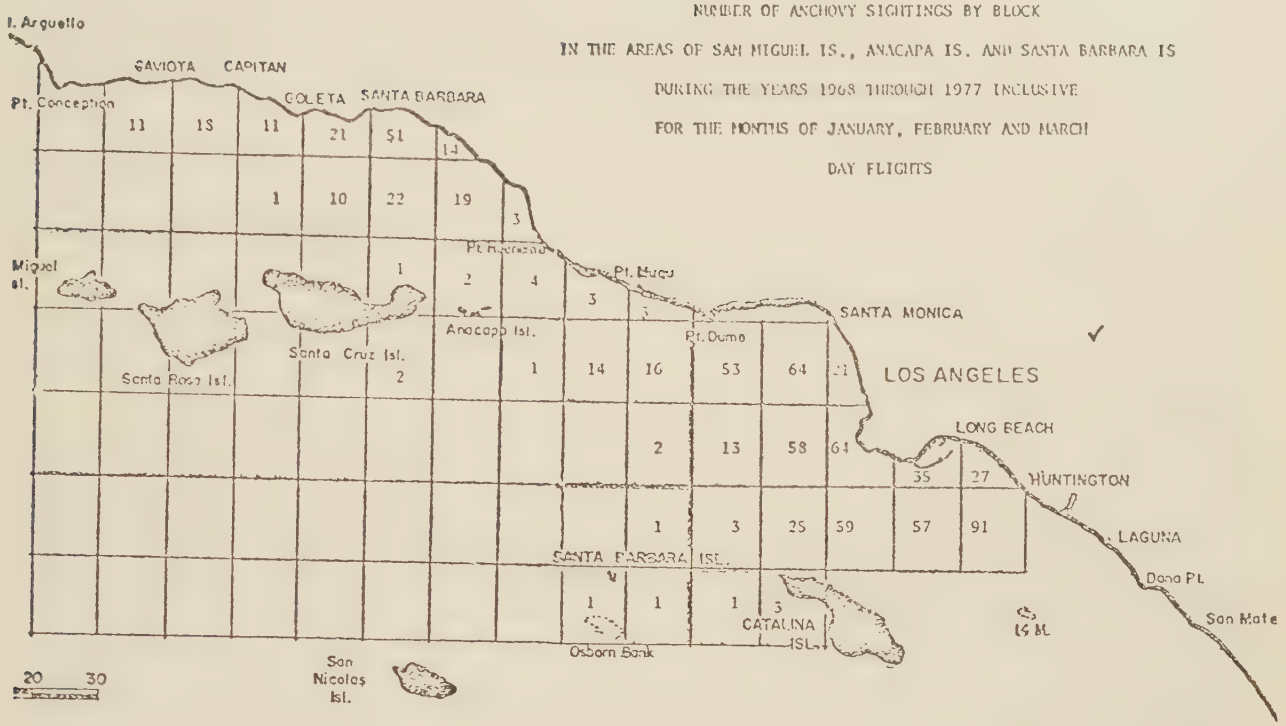
NUMBER OF ANCHOVY SIGHTINGS BY BLOCK

IN THE AREAS OF SAN MIGUEL IS., ANACAPA IS. AND SANTA BARBARA IS

DURING THE YEARS 1968 THROUGH 1977 INCLUSIVE

FOR THE MONTHS OF JANUARY, FEBRUARY AND MARCH

DAY FLIGHTS



AERIAL MARINE RESOURCES MONITORING SYSTEM

TONS OF ANCHOVIES BY BLOCK

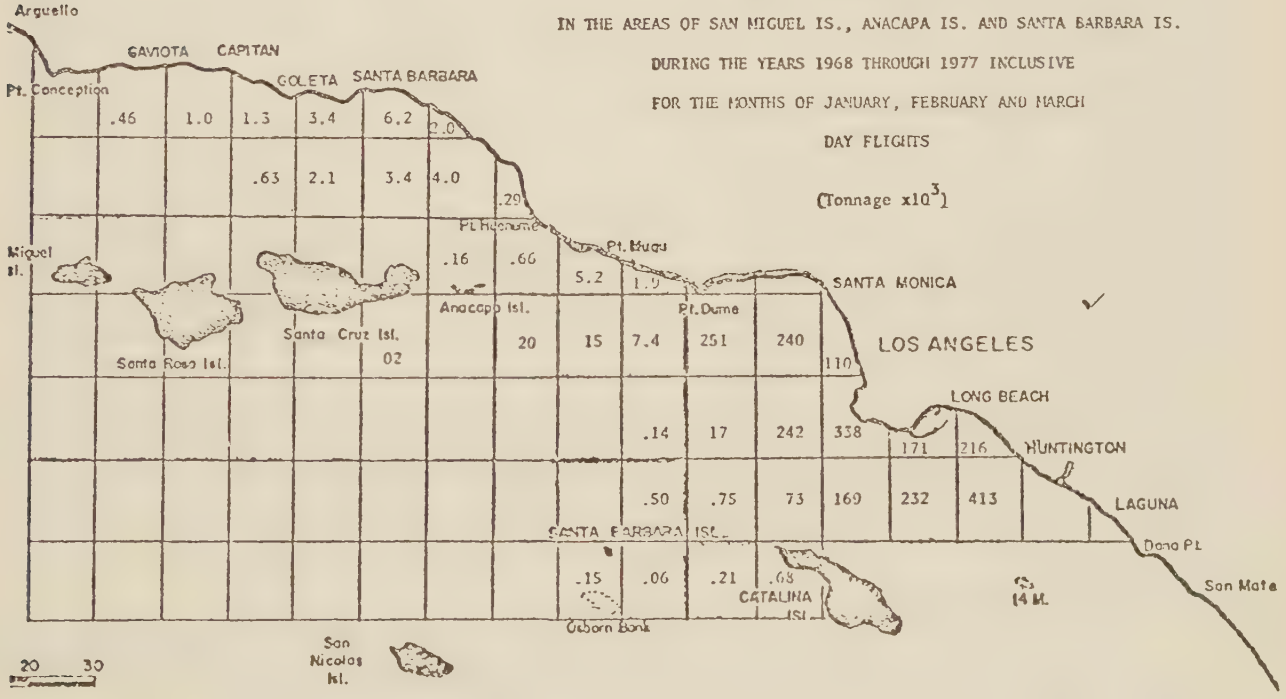
IN THE AREAS OF SAN MIGUEL IS., ANACAPA IS. AND SANTA BARBARA IS.

DURING THE YEARS 1968 THROUGH 1977 INCLUSIVE

FOR THE MONTHS OF JANUARY, FEBRUARY AND MARCH

DAY FLIGHTS

(Tonnage $x10^3$)



Socio-Economics Studies

During February Industry Economist Jane McMillan completed the Regulatory Analysis required for the draft Jack Mackerel Plan and finished Administrative Report No. LJ-79-2 entitled, "Report on sources of socio-demographic data relevant to fisheries management in California." Both of these are being circulated to interested persons.

McMillan and Huppert also began preliminary work on the project to estimate production functions for various types of fishing vessels. A non-linear regression program in ESP (Economic Software Package) is being tested with data from Pacific Northwest trawlers.

Rockfish Larvae Abundant Off California

Fishery Biologist John MacGregor reports that rockfishes of the genus Sebastes are the backbone of the saltwater sports fishery along the California coast especially during the winter months when more desirable game fish are not abundant. Rockfishes are also a very abundant component of the larval fish populations sampled in CalCOFI net tows.

Recent studies of rockfish larvae have been directed toward species identification and some data has been gathered on the occurrence of four species of larval rockfish, bocaccio (S. paucispinis), shortbelly rockfish (S. jordani), cow rockfish (S. levis), and coral red rockfish (S. macdonaldi). Preliminary rough estimates, uncorrected for areas and months not sampled, show that for 1972 and 1975 data 89% of all rockfish larvae taken on CalCOFI cruises were taken off California and 11% off Baja California. The number of stations sampled was about the same in each area. There are about 50 species of rockfish found off California. Bocaccio comprised 5.0% of all rockfish larvae taken; cow rockfish, 0.5%; shortbelly rockfish, 8.4%; and coral red rockfish, 0.8%. The first three species accounted for slightly higher percentages of rockfish larvae taken off California only. The coral red rockfish, which is more southern in distribution, accounted for 7.0% or rockfish taken off Baja California.

In the southern California partyboat catch (January-March 1978), 21.1% of all fish caught were bocaccio. The bocaccio was the most frequently taken rockfish accounting for 29.9% of the rockfish catch. The cow rockfish made up 1.0% of the rockfish catch, and the shortbelly rockfish accounted for 0.1% of the catch. The coral red rockfish was not recorded as found in the catch.

Although the large number of shortbelly rockfish larvae indicate that this is an abundant species, individuals of this species do not attain a length of more than 12 inches, and therefore are not desirable from the angler's point of view.

Manuscripts Completed

Keith Parker finished editing proofs of his paper entitled, "Variable area transect estimation of population density," to be published in the April

issue of Journal of Wildlife Management. Parker has also completed a draft to be submitted to Fishery Bulletin entitled, "Direct estimation of spawning frequency and spawning biomass from spawning products."

Alec MacCall completed a draft manuscript entitled, "Fishery influences on the abundance of higher marine vertebrates: simulation study."

Oceanic Fisheries Resources Division

TUNA RESOURCES PROGRAM

Tuna Resources Real-Time Environmental Data Collection System Being Updated

Collection of surface marine weather observations by the La Jolla Laboratory began in 1959 and has continued to the present. Under the current system, the data are collected from a Federal Aviation Administration (FAA 6052) circuit and punched on paper tape. The data are transferred from paper tape to cards and are processed on the Burroughs 6700 computer at the University of California (UCSD). Products from the processing of these data are plots of sea surface temperature, wind direction and speed, and mixed layer depths. These lots are transmitted weekly to vessels at sea via radio station WWD and the data are saved for future research.

In February Mathematician Al Coan met with members of the La Jolla Laboratory's Tuna Resources Program--Dick Evans, Oceanographer, Mark Sweeney, Communications Specialist, Jim Renner, Fishery Biologist, Stan Moore, Computer Technician, Bob Nyam, Computer Technician, Paul Nelms, Coder, and Forrest Miller, Meteorologist--to discuss the phasing of an updated real-time data collection system. The new system, consisting of a Hewitt Packard 9825A computer, floppy disk drives, CRT scope, line printer and new line (West Coast Marine Circuit) will expedite collecting real-time environmental data by eliminating the punching of data onto paper tape and cards.

The group decided to test the new system starting on March 5, 1979 and extending for a one-month period to April 9, 1979 with the option of extending the test period for one more month to May 1979 if any complications are encountered. The current system will continue running during the test period as a back up. Extension of the test period will be assessed on April 9, 1979 by a comprehensive evaluation of the system. Accuracy and efficiency of the new system will be assessed by evaluating products, software and backup systems.

Future prospects for the new system include the gradual phasing out of most of the processing of real-time data currently done on the Burroughs 6700 computer at UCSD. Certain advantages of the new system have already been noticed in the increased number of observations being received on the new line.

Biological Sampling of Foreign Imports of Atlantic Tunas Continues in Puerto Rico

Atlantic-caught tunas transshipped to Puerto Rico have been sampled routinely for biological information by Technician Eugene Holzapfel of the La Jolla Laboratory since March 1975. Data on fork length, weight and species composition were collected.

Results of the sampling during the period January thru February 1979 are:

Species	Gear	No. of Samples	No. of Fish Sampled	Tonnage Samples (MT)
Yellowfin	baitboat	4	309	59
	purse seine	4	141	1852
	longline	1	50	106
Skipjack	baitboat	2	107	208
	purse seine	9	454	2882
Bigeye	baitboat	2	115	6
	purse seine	1	43	266
	unknown	1	38	104
Albacore	longline	5	250	1020
Total		29	1507	6503

Fishery biologist James Renner, who processes the samples at the SWFC, reports that all samples received to date are from vessel catches which occurred during the 1978 calendar year.

Atlantic Yellowfin Tuna Fishing Analysis Presented to Fisheries Society

Dr. Norman Bartoo, Fishery Biologist, presented a paper describing the eastern Atlantic yellowfin tuna fishery and analyzing the effects of management regulations on the fishery to the annual meeting of the California-Nevada Chapter of the American Fisheries Society. The presentation dealt with the structure of the fishery and effectiveness of the 3.2 kg minium size regulation. Bartoo also reported that a final draft of the paper co-authored by Atilio Coan, Jr., Mathematician, has been completed and will soon be presented for consideration as a publication to the Fishery Bulletin.

Planning Begins for International Skipjack Year Tagging and Fishery Observer Projects

Planning for a skipjack tuna tagging project in the western Atlantic in 1980 and a project to place fishery observers on commercial tuna vessels fishing in the Atlantic in 1981 has begun, according to Ronald G. Rinaldo, Fishery Biologist. The projects will be part of the NMFS contribution to the International Skipjack Year Program of the International Commisssion for the Conservation of the Atlantic Tunas (ICCAT). A contract to prepare planning documents for these projects was awarded to Living Marine Resources, Inc., San Diego, on February 15, 1979.

The primary purpose of the western Atlantic tagging project is to contribute to a better understanding of the distribution, migration and stock structure of Atlantic skipjack tuna. Fishing and biological information collected by the fishery observers will be used in the analysis of fishing effort and catch in the multispecies Atlantic tuna fishery.

FAX Program Vessels Observations Highest Since 1976

During February 1979, 27 tuna seiners and 2 research vessels contributed synoptic weather data to the NMFS FAX Advisory Program. A total of 335 weather and 17 XBT observations was reported via NMFS-licensed radio station WWD. The table below lists data pertaining to program participation for February 1976 through February 1979. The numbers of total observations and boats reporting are at the highest February level since 1976.

	February			
	1979	1978	1977	1976
Number of vessels w/equipment	48	54	64	73
Number of vessels reporting	29	27	22	32
Number of weather observations reported	335	263	203	327
Number of XBT observations reported	17	49	5	39
TOTAL OBSERVATIONS	352	312	208	360

Leading all program participants this month are Captain Joseph Silveira and the crew of the tuna seiner, Cheryl Marie, with 20 weather and 16 XBT observatins. We extend our thanks to Captain Silveira and crew and all other contributing participants.

Swordfish Sampled in California Bight; Preponderance of Females Found

Results have been analyzed from data and biological specimens collected from 93 swordfish harpooned in the California Bight, as part of an attempt to learn about swordfish spawning seasons and migrations. Biologists in the billfish assessment team under the leadership of James Squire, Fishery Biologist, completed eight trips aboard five commercial vessels to obtain the data.

Results indicate a preponderance of females (72.8%) over males (27.2%) and a greater average weight for females (260 lbs) than for males (214 lbs). The weights of these fish ranged from 137 to 436 lbs (round weight). Collected data are also being used to establish the length-weight relationship for male and female swordfish, and a factor for converting the measurements of dressed fish sampled ashore to the actual length of these fish as caught. Sampling is expected to continue in 1979 with emphasis on the collection of gonads from swordfish caught early in the season to determine how their migration through the Bight relates to their spawning cycle.

The billfish assessment team has prepared a newsletter that contains some results of the swordfish at-sea sampling program which began in August and extended through November 1978. The newsletter will be sent to cooperating commercial swordfishers and other interested persons.

Results of the 1978 Cooperative Marine Game Fish Tagging Program

The results of the 1978 cooperative tagging program for billfish and other oceanic species show the number of billfish tagged by cooperating marine game fish anglers was 1,054, an increase of 143 billfish tagged over the 1977 record of 911 fish. A total of 542 striped marlin (Tetrapturus audax), 250 black marlin (Makaira indica), 217 sailfish (Istiophorus platypterus), 29 blue marlin (Makira nigricans), one short billed spearfish (Tetrapturus augustirostris), and 15 swordfish (Xiphias gladius) were tagged by the anglers and released.

In addition to billfish, several other marine game fish species were tagged and released. These were mako shark (58), hammerhead shark (2), blue shark (18), and great white shark (6). Other species of fish included roosterfish (11) and dolphinfish (12). Also tagged in the San Francisco Bay Area were 155 white sturgeon through the efforts of the Tiburon Laboratory. A total of 1,349 fish of all species was tagged in 1978, an increase of 227 fish over 1977.

The tagging of billfish was centered in southern California, Baja California, Mexico, off northeastern Australia, and in northern New Zealand. Other locations for billfish tagging include several of the ports of Mexico, Costa Rica, Panama, Hawaii, New Guinea, and for the first time, Japan.

Twenty-six tagged billfish were recovered in 1978, seven more than reported in 1977. Recoveries by species and area were: black marlin, 9

recoveries in the Coral Sea off northeastern Australia; 3 striped marlin, 1 near the tip of Baja California (out 1 year) and 2 in southern California (both out 1 year, tagged off southern California; 1 sailfish recovered at the point of tagging 4.7 years after tagging (a record time-out for any Pacific billfish); and 6 swordfish off southern California. Other game fish recoveries were: 1 yellowtail (Seriola grandis) and 2 mako sharks recovered off New Zealand; 1 yellowfin tuna (Ghi, 107 lbs) recovered 42 miles south of the point of tagging near Kona, Hawaii, 6-1/2 months after tagging; 1 black sea bass (390 lbs) tagged by a diver at Anacapa Island 1,478 days prior to recapture at the same location as tagged.

A new development in the cooperative program is the harpoon-tagging of free-swimming swordfish off southern California. Results are encouraging considering the limited number of swordfish tagged in 1978 (15 fish) by interested big game marine fish anglers. Six fish have been recovered by commercial and sport fishermen in the same area of tagging up to 35 days after tagging. The preliminary return rate of 40% gives encouragement to anglers to increase their tagging effort in 1978.

MARINE MAMMAL ASSESSMENT & MONITORING PROGRAM

Documentation Manual for Porpoise Mortality Monitoring Completed

A SWFC administrative report entitled, "Procedures for Monitoring Porpoise Mortality: Documentation Manual," authored by Bruce Wahlen, has been completed. The report provides documentation of the procedures involved in the computer-assisted porpoise mortality monitoring process. It also includes a description of the flow of information from the fleet and from NMFS observers to the La Jolla Laboratory, ending in the stock-by-stock mortality estimate.

Final Draft of Fisheries Management Plan for Spiny Lobsters Completed

Fishery Biologist Tim Smith completed the final draft of the Fisheries Management Plan for Spiny Lobsters of Hawaii, Guam, American Samoa and the Northern Marianas Islands following a meeting with the Advisory Panel held in early February in Honolulu. The draft is being reviewed by the Advisory Panel, the Scientific and Statistical Committee (SSC), and the Regional Council.

The review process will be continued by the SSC and the Regional Council in March in Honolulu and in Saipan.

Initial Editing of Papers for Population Dynamics Book Completed

Papers contributed for the book entitled, Population Dynamics of Large Mammals, have all been initially edited by Dr. Charles Fowler of Utah State University and Dr. Tim Smith of the SWFC. Drs. Smith and Fowler were co-conveners of a conference on large mammal population dynamics held in Logan, Utah in May 1978. Publication of the book is scheduled for late 1979.

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

Processing of Specimens from Observer Cruise Completed; Porpoise Data Editing Proceeds

Ruth Miller, Biological Technician, and Lonnie Dick, Biological Aid, have completed processing nearly 1600 biological specimens collected by observers aboard U.S. tuna seiners during 1978. Observers routinely take samples from marine mammals incidentally killed during fishing operations, collecting material from gonads, the reproductive tract, jaw section, and, from less common stocks, the head or entire carcass. Samples were collected on 88 cruises in 1978, and included, for the first time, material from a false-killer whale, Pseudorca crassidens.

Miller has coded all life history data from the samples, including such data as lengths and weights of gonads, and lengths, weights, and sex of fetuses. These data will be keypunched, edited for errors, and entered on the computer data base by mid-March for use in stock assessment and life history analyses. Having the life history data available on a data base allows easy access and cross-referencing of this information, so that specific events or characteristics of a porpoise set may be correlated with the biological state of a particular animal.

Editing programs for pre-1978 porpoise life history data base and for all 1979 porpoise data bases have been tested and approved by the Data Management Subtask of the Marine Mammal Assessment and Monitoring Program. The editing programs are designed to review the porpoise life history data that are obtained by NMFS observers aboard U.S. tuna vessels to note logical discrepancies for subsequent correction.

Satellite-linked Porpoise Tracking System Tested in Hawaii

Jacqueline Jennings, Tagging Project Leader, and Walter Gandy, National Fisheries Engineering Laboratory (NFEL) Electrical Engineer, traveled to Sea Life Park, Oahu, Hawaii to test a transmitting system for use in studying movements of pelagic porpoise schools using satellite-linked telemetry. The transmitter unit was placed (using a specially designed harness) on a captive bottlenose dolphin, Tursiops truncatus, maintained at the park. The unit successfully transmitted during 8 overhead passes of the NIMBUS-6 satellite, which is maintained and operated by the National Aeronautics and Space

Administration (NASA). Using a portable receiver, Jennings and Gandy recorded as many as 74 successful "hits" of the satellite by the signal. Although this high number of "hits" is superfluous since the satellite will allow only 11 "hits" for each user on any one pass, it indicates that the transmitter reliably outputs a correctly phased and coded signal.

NASA has confirmed that the satellite received their signal on 6 of the 8 passes. In one instance, the satellite had not been properly activated by NASA.

Using the signal, the satelitte computers were able to repeatedly "fix" the point of transmission. Accuracy averaged + 12.6 nautical miles from Sea Life Park, and in one instance the transmission was pin-pointed exactly to park coordinates.

Preparations Continue for Capture Myopathy Workshop

Dr. Warren Stuntz, Leader of the Porpoise Behavior and Physiology Project, continued his preparations for the workshop on the physiological effects of chase and capture on porpoise, which will be held at La Jolla May 1-3. Stuntz has completed sending invitations and has received a favorable response.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Caprellid Amphipods May Remain Reproductively Viable During Winter

The caprellid amphipod Metacaprella kennerleyi is under study by Tony Chess, Fishery Biologist with the Nearshore Recreational Fish Communities Task. This amphipod dominates the diets of greenlings, sea perches, and other important recreational fish species during the summer months. In some areas during the summer, densities of this amphipod reach over 80,000/m^2; in the fall, densities suddenly decline to 100/m^2 or less; and during the winter, this organism is unimportant to fishes as food.

The percentage of ovigerous females had been observed to decline from about 82 percent in early summer to 11 percent in late summer, so the species was assumed to be reproductively inactive during the winter, as has been reported for other caprellid species. However, studies show that although the species was sparsely distributed during December, 47 percent of the mature females collected at this time were ovigerous. If this condition persists, it could represent an important selective advantage. Remaining reproductively viable during the winter certainly would make the species more responsive to the irregular onset of spring and summer upwelling, and consequent phytoplankton blooms upon which it thrives.

Food Preferences of Fishes in Coralline Alga Habitat Studied

A model of predator-prey interactions in Californian nearshore habitats is being developed by Peter Adams, Fishery Biologist with the Rockfish Analysis Task. Initially, the study is concentrating on a habitat dominated by the coralline alga Calliarthron tuberculosum, and emphasizing preferences the fishes have for particular food items.

The study requires knowledge of prey that are available on each feeding substrate exposed to the fishes. Six such feeding substrates have been defined: sand patches, rock surfaces, and four different species of algae. Each of these substrates is characterized by a specific texture and degree of complexity and each offers a somewhat different array of prey to foraging fishes. Prey fauna associated with the sand substrate is most distinctive, while the prey fauna on the rock substrate is most diverse. The substrates represented by the four species of algae offer similar lists of prey species. Approximately 35 percent of the prey species have occurred on all four, and this similarity increases to over 75 percent for the commonest species. Significantly the relative abundance of these prey differ greatly from one algae substrate to another, and so in fact each offers fishes a distinctive selection of prey.

"Wild Kingdom" T.V. Show Depicts Activities of Fish Communities Task

The "Wild Kingdon" episode involving activities of the Fish Communities Task, was shown on nation-wide television this month. With Investigation Leader Edmund S. Hobson participating, the show depicted principles of predator-prey interactions among reef fishes.

FISHERIES DEVELOPMENT INVESTIGATION

Results of 1976 Release of King Salmon Reported

Fishery Biologist Roger Green has been examining size at release and return rate data for pen-reared salmon releases at Tiburon Laboratory. Results of the 1976 release of king salmon (reported in the December 1978 Monthly Report) showed that the larger sizes, at release, appeared in greater numbers in the tag returns. In February, the examination of data for the 1975 and 1976 coho salmon was completed. The same relationships between size at release and percentage return were shown.

Green also reported that progress is continuing on a manuscript describing the salmon pen-rearing experiments at Tiburon Laboratory.

PHYSIOLOGY INVESTIGATION

Viability of Striped Bass Eggs and Larvae Correlated with Parental Condition

The Physiology Investigations staff concentrated their efforts on preparation of manuscripts, two of which are intended for presentation at the Early Life History of Fish Symposium. Data from three years of laboratory and field studies are being analyzed to determine the extent inherent parental factors contribute to gamete condition and viability, and growth and survival of striped bass eggs and larvae. Poor physiological conditions in spawning adults have been correlated with poor egg quality and quantity, and have resulted in smaller larvae with high mortality rates. Pathological autopsies and histochemical analyses of spawner tissues suggest several pollutants and heavy parasitization are the main causes for these poor conditions.

Of primary importance in environmental research is the ability to relate laboratory-derived data to actual conditions in the field. This month, the California Department of Fish and Game provided the staff with eight years of data on stomach contents of field-caught striped bass larvae. These data will allow comparisons of estimates of daily food ration between laboratory and field animals. The object is to describe the energy requirements of larvae at different survival and growth rates, and to determine the level at which these needs are met in the natural environment.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

Work Continues on PACES (Pacific Area Cooperative Enforcement System); Training Program Planned

Fred Kellenberger, Data Systems Manager, reported that work is continuing on the Pacific Area Cooperative Enforcement System (PACES). PACES, a cooperative enforcement system among Southwest Region (SWR), SWFC and California Fish and Game (CF&G), will contain information on commercial fishing vessel restrictions, commercial fishing vessel sightings, boardings, patrols and offensive investigations. Design and programming has been completed by Cindie Tashima, Potomac Research Incorporated (PRI) contractor. The system was well received by Charles Fullerton, CF&G Director, and CF&G administrative and enforcement officials, although CF&G required minor changes in some of the report formats. On February 9, a meeting of the CF&G Captains and the SWR Enforcement Agents was held at the CF&G offices in Long Beach. PACES was presented to the group, and tentative plans were developed for a PACES training program throughout CF&G offices in California. Training will begin in March 1979.

On February 14, Gary Smith of SWR, Cindie Tashima of PRI, and Fred Kellenberger of SWFC, met in Terminal Island to discuss the progress of PACES. The PACES User Manual was revised and plans were made for PACES operation in Terminal Island and Long Beach.

A meeting was held on February 22 with Jim Allen of General Services Administration (GSA), Pat McAleer, PRI Manager, Tashima and Kellenberger to discuss Milestone II of the PACES contract. Milestone II consisted of changes to standard reports that were discussed at various PACES user meetings. Milestone II was reviewed and approved by GSA and SWFC.

CalCOFI Data Management System

Computer Systems Analyst Dorothy Roll and CalCOFI Data Manager Rich Charter drafted a work plan to implement all phases of the CalCOFI Data Management System.

The initial phase of this system was successfully implemented in June 1978 for the anchovy biomass estimate. It was noted then that modification and correction of some of the data verification programs would be necessary in the initial phase. One program which pre-screens the data, checking for obvious errors, requires a total rewrite. This program will be coded in standard ANSI FORTRAN IV to allow use of the program with hardware systems other than the INFONET system, which the SWFC presently uses. Because preprocessing and statistical analysis on the INFONET system is very costly, another hardware system will probably be used for interface with INFONET's data base management system in the future.

Based on the drafted work plan, a task order was issued to PRI. PRI contractor Roger Grismore has been assigned the programming task. His first major milestone is the rewrite of PRETOW, which prescreens the CalCOFI net tow data.

During February, a draft copy of the CalCOFI/INP Data Dictionary, which contains a description of all CalCOFI/INP data elements, was also produced. The data dictionary will assist the CalCOFI/INP Data Management Systems Subcommittee in standardizing and comparing data elements.

Roll reviewed the status of the CalCOFI Historical Data System, which is a subset of the CalCOFI Data Management System. Data from six of the thirteen 1975 cruises are in the data bases HOCSDB and HUNSIZ. HOCSDB contains environmental data elements describing occupied stations and HUNSIZ contains the species codes and counts of unsized larvae. The unique record key in HUNSIZ links that record to a record in HOCSDB for environmental information.

To update the historical data bases with 1969 and 1972 data, new software must be written for data validation because the source data format are not like that of the 1975 data. The series of preprocessing programs will be implemented on the Burroughs computer in order to reduce computer costs on INFONET. Only validated data files will then be loaded on INFONET data bases.

Oceanographic Research Interactive Onboard Network (ORION) Computer System to be Installed on Research Vessel

Plans have been made to install the Oceanographic Research Interactive Onboard Network (ORION) computer system onboard the Research Vessel David Starr Jordan to collect and analyze data related to CalCOFI research expendable bathythermographs, navigation, tracking, and shipboard housekeeping. The system consists of a Hewlett Packard (H.P.) 9845 computer, two H.P. 2640 CRT units, and a analog-digital computer. A contract has been issued to GSA/PRI to develop the system design and computer software. Larry Galligan, PRI Systems Analyst, has been assigned this task. Meetings have been held with various users to define the requirements. A implementation plan, Milestone 1, which was developed by Galligan as part of the contract, was approved by GSA and SWFC at a February 22 meeting.

Other Data Management Projects

Dorothy Roll, Computer Systems Analyst, and Bob Butler, Computer Programmer, met with Jim Bybee, SWR, and Pat Downley, SWR, in Terminal Island on February 13. The purpose was to implement the computerized monthly reports from the Market News Data Management System and to refine the specifications for the Market News weekly reports. Market News Data Management System contains catch and pricing information on tunas. Problems with the monthly report program were resolved and specifications for the weekly reports were clarified during the meeting. Butler is proceeding with the writing/modifying of programs which update the data base files and generate standard reports. The data will be keyed on-line on a keyboard terminal.

Butch Burris, Computer Programmer, produced 2 summary reports from the California Fish & Game (CF&G) tape of 1975 commercial landing data, for Jim Byee of SWR. One report summarized landings by boats and dealers for each of the 17 specified ports and the other summarized landings by dealers for each of these same ports. These statistics were used by Bybee for his report to the Port of Los Angeles.

Progress continues on creating a tape file on California fisheries data for the Coastwide Data System (CWDS). The Coastwide Data System will include fisheries data from California, Oregon, Washington and Alaska. Dorothy Roll compared the elements in the CF&G file with the desired elements for the CWDS tape and noted some of the elements are not directly available from the CF&G file. In a letter to Richard Heimann (CF&G), Dorothy requested confirmation on her matches of the like elements, her interpretation of the code values and resolution on how to handle the missing elements. His response letter, which resolved the issues, specified that the CF&G boat number must be converted to either the United States Coast Guard document number or the California State Marine Board document number. The formula for scrambling the document number will be forthcoming. With specifications now clarified, Butch Burris began the program design and coding to create the CWDS data tape.

In cooperation with the Oceanic Fisheries Resources Division, Bob Butler is refining and debugging the program which edits the 1979 Marine Mammal Sighting-Effort data. This data verification program is the last in the series of edit programs for the 1979 porpoise observer data sets.

A computer graphics class was held at the La Jolla Laboratory on February 1, 1979. Bob Lapsley, Computer Services Corporation (CSC) representative, demonstrated the software plotting package DISSPLA to computer users utilizing data from the various SWFC data bases. Scientists, oceanographers, biologists, statisticians and economists can convert reams of tabular fisheries data into meaningful graphic display using DISSPLA.

The Southwest Center-Region Data Management Committee met on Febraury 23, 1979 to discuss data management activities. The meeting was attended by Nancy Wiley, Tiburon Laboratory; Nick Iorio, Oceanic Fisheries Resources Division; Rich Charter, Coastal Fisheries Resources Division; George Liao, Honolulu Laboratory; and Fred Kellenberger, SWFC (Chairperson). The members of the Committee plan to produce a document that contains the Southwest data collection forms and a description of the various data files that are used within the Southwest.

PUBLIC RELATIONS

Honolulu Laboraory

R. Uchida, Leader of the Survey of Insular Resources Task, served as Associate Judge at the Intermediate and High School Display and Research Projects at Lanakila Baptist School in Honolulu during its annual Hawaiian Science and Engineering Fair competition.

Fishery Biologist R. Gooding served as Chief Judge at the Wahiawa Intermediate School's Hawaiian Science and Engineering Fair, Display and Research Projects competition.

La Jolla Laboratory

Press Releases issued on:

February 14 - U.S.-Spanish Scientists Team to Study Squid."

February 20 - "Sakagawa Named Chief of Oceanic Fisheries Resources Division."

SEMINARS

La Jolla Laboratory

February 6 - Dr. George Pickwell of the Naval Ocean Systems Center, San Diego, spoke on "Aspects of Sea Snake Biology."

21 - Professor Daniel Weihs, NOAA Resident Research Fellow, from the Techion - Israel Institute of Technology in Haifa, Israel, discussed "Fish Locomotion from an Engineer's Point of View."

TRAINING

February 5 - Edmund S. Hobson, Supervision and Group Performance, OPM - Tiburon Laboratory.

MEETINGS AND TRAVEL

Honolulu Laboratory

February 1-2 - Laboratory Director Richard Shomura attended the Small-Scale Fisheries Workshop that was organized by Dr. Morton M. Miller, Chief of the Economics Staff, and Dr. Michael K. Orbach, Cultural Anthropologist, of the Office of Resource Conservation and Management, both in NMFS, Washington, D.C. About 20 persons having interest and expertise in small-scale commercial fisheries were invited from Hawaii and the western Pacific to participate in the workshop in the Honolulu Laboratory conference room.

5 - R. Uchida, Leader of the Insular Resources Task, and Fishery Biologist H. Yoshida attended a meeting of the Spiny Lobster Plan Development Team and a joint Spiny Lobster Plan Development Team-Advisory Subpanel meeting.

7 - Shomura met with Honolulu Laboratory staff members Dr. Michael Adams and Heeny Yuen, Henry Sakuda of the Hawaii Division of Fish and Game, and Dr. Jeffrey Polovina (who joined the Laboratory staff later in the month) to discuss economic and biological data in the commercial fishing area.

- Dr. Robert Doktor, University of Hawaii, met with Dr. Skillman, T. Otsu, and G. Liao of Honolulu Laboratory, to discuss a study of the dynamics of the Honolulu Laboratory stucture proposed by Doktor.

11-17 - Shomura traveled to Japan to present a paper, "Ecosystem dynamics of seamounts--a working hypothesis," by Shomura and Barkley, at the Fourth Cooperative Cooperative Study of the Kurioshio Symposium held in Tokyo, Japan. While in Japan, Shomura met with Dr. Shoji Ueyanagi of the Far Seas Fisheries Research Laboratory, Shimizu, Japan, to discuss details relating to the forthcoming (mid-June 1979) Stock Assessment Workshop to be held in Shimizu.

12 - Yuen, in place of Shomura, attended the Endangered Species - Section 7 Workshop. The purpose of the workshop was to inform federal agencies of: (1) their responsibilities in carrying out programs for the conservation of endangered and threatened species and (2) the necessary procedures that should be followed when a federal agency contemplates an activity which affects such species and their habitats.

15 - Acting Laboratory Director Otsu attended a meeting called by Dr. Stanley Swerdloff, Project Manager, Hawaii Fisheries Plan, to discuss the State Fisheries Development Plan. Others present at the meeting were Dr. Adams and W. Matsumoto and Uchida of the Honolulu Laboratory, and H. Ness, D. Gates and R. Iversen of the Southwest Region.

19 - Shomura met with Peter Coleman, Governor of American Samoa, to discuss matters pertaining to the joint PTDF/Honolulu Laboratory tuna-aggregating project for American Samoa and other tuna fisheries development matters.

20 - Shomura attended an all day meeting of the Board of Directors, Pacific Tuna Development Foundation (PTDF), at the Kuilima Hotel.

21 - Shomura attended the Pacific Islands Fisheries Development Council meeting at the Kuilima Hotel. The Tuna Development Plan was discussed.

22 - Herbert Hirata and Mike Keyes of the National Weather Service (NWS) met with Shomura and Uchida and Dr. Skillman to discuss NWS's interest in "piggy-backing" on a NWHI cruise to install some weather equipment on French Frigate Shoals before the Coast Guard closed their facilities there.

- Shomura attended the Tuna Aggregation Device Workshop in the conference room. The workshop was arranged by the Honolulu Laboratory at the request of Andrew Gerakas, Pacific Tuna Development Foundation (PTDF), to provide information for fishery officials from Pacific islands on the fabrication of fish aggregating buoys.

23 - Shomura, Otsu, Matsumoto and Dr. Skillman discussed the cooperative aggregation buoy project with Henry Sesepasara of American Samoa.

28 - Shomura discussed the Honolulu Laboratory's tuna research plans with senior staff members.

La Jolla Laboratory

January 29 - February 1 - Dr. J. Powers, Dr. W. Perrin and Dr. T. Smith, all of the La Jolla Laboratory's marine mammal programs, traveled to Seattle to participate in a workshop on stock assessment of marine mammals taken incidentally in fisheries.

February 1-2 - Dr. R. Lasker, Leader of the Coastal Fisheries Resources Division, spoke on the relation of oceanography to anchovies at the Outer Continental Shelf Conference on California Shelf Circulation held at Scripps Institution of Oceanography. Dr. Michael Laurs, Leader of the Albacore Fisheries Program, spoke on the migration of albacore at the same conference.

2 - Fishery Biologist Dr. N. Bartoo presented a paper on the effects of yellowfin tuna regulations in the eastern Atlantic yellowfin tuna fishery at the Wildlife Society-American Fisheries Society Meeting in Long Beach.

- Bartoo attended the American Fisheries Society Cal-Nevada Chapter annual meeting in Long Beach, CA. A portion of the meeting was devoted to current research related to problems of research and management in marine fisheries.

2-4 - Dr. T. Smith, Fishery Biologist, traveled to Honolulu to meet with Planning Team and Advisory Panel on Spiny Lobsters.

4-8 - Dr. D. Huppert, Leader of the Commercial and Recreational Fisheries Research for Management Program, traveled to Seattle to present amendments to the anchovy plan at the meeting of the Pacific Fisheries Management Council's Statistical and Scientific Committee (SSC of the PFMC) and to attend a panel meeting on economic data.

5-8 - Center Director I. Barrett traveled to Seattle to attend the meeting of the SSC of the PFMC, where long discussions were held on the salmon plan. The group reviewed the Dungeness Crab plan and the shrimp plan.

6 - Dr. W. Perrin, Leader of the Marine Mammal Biology and Technology Program, Dr. J. Powers, Leader of the Marine Mammal Monitoring and Assessment Program, and Dr. G. Sakagawa, Leader of the Oceanic Fisheries Resources Division, met at Terminal Island with Gary Smith, his staff, and Dan Miller of California Department of Fish and Game, to discuss coastal marine mammals, the impact of tuna boat gear regulations on porpoise mortality, and the impact of the $400,000 cut in the Region's FY 81 budget on enforcement.

7-8 - Laurs traveled to Pasadena to attend a SEASAT Workshop on Data Availability and Quality.

7-14 - Fishery Biologist J. Jennings traveled to Honolulu to conduct a test of satellite-linked transmitter on captive dolphin, to observe freeze-branded dolphins, and to plan future experiments.

13 - Computer Systems Analyst D. Roll traveled to Long Beach to implement computerized monthly report from Market News Data System and to review specifications for computerizing the weekly reports from this system.

14 - Data Systems Manager Fred Kellenberger traveld to Terminal Island to meet with Southwest Region staff on data management activities.

14-16 - Laurs traveled to Arcata, CA to make a presentation to the Humboldt State University American Fisheries Society Chapter and to meet with Sea Grant personnel at the University.

22 - Center Director Barrett traveled to Tiburon to discuss the groundfish plan with Laboratory Director and staff.

22-23 - Sakagawa and Squire traveled to Long Beach to participate in the PFMC's Billfish Management Team and Advisory Panel meetings.

23 - Kellenberger traveled to Tiburon to attend a Center/ Region Data Management Committee meeting.

26 - Planning Officer David Mackett met with Czerwonka of Fx5 in Washington and Dan Furlong of the Southeast Region to discuss options for the planning of management systems revision including zero based budgeting data. Following the meeting, Mackett attended the Recreational Fisheries program meeting held at the National Wildlife Federation offices in Washington.

28 - California Department of Fish and Game personnel --MacCall, Mais and Karpov--joined SWFC staff-- Stauffer, Lasker, Hunter, Thrailkill--in La Jolla to plan upcoming anchovy spawning survey.

Pacific Environmental Group

February 1-2 - Fishery Biologist Andrew Bakun traveled to La Jolla to present a paper at OCS seminar on California Continental Shelf and Slope Circulation and Exchange.

15-16 - Dr. Douglas McLain, Oceanographer, traveled to Tiburon, CA to attend a meeting with Scripps Institution of Oceanography and Oregon State University concerning computerized XBT equipment.

16 - Gunter Seckel, Chief of PEG, traveled to Davis, CA to present a seminar and consult with faculty at the Department of Land, Air and Water Resources at the University of California, Davis.

Tiburon Laboratory

January 30
February 8 - Economist Edward Ueber traveled to Newport, Oregon and Seattle, Washington on assignments for the Pacific Fishery Management Council.

6-7 - Laboratory Director Norman J. Abramson attended the Pacific Fishery Management Council's Statistical and Scientific Committee (SSC) meeting in Seattle, WA.

8 - Lt. Patrick Rutten of the NOAA Corps and a member of the Tyee Club, Jean Lestenget, traveled to Johnson's Oyster Ranch on Drakes Estero to continue the experimental fishing being conducted for rock crab. Approximately 150 rock crabs were caught and brought back to the Laboratory.

13-14 - Dr. J.A. Whipple, Fishery Biologist, traveled to Rockville, MD to attend a meeting held by the new Marine Pollution Office for the purpose of discussing the Marine Sanctuaries 202 funding.

14 - Fishery Biologist D. Ralph traveled to the Feather River Hatchery to accomplish separation arrangements in the raceways for the king salmon fingerlings scheduled for delivery to the Tiburon Laboratory in June 1979.

13-16 - Abramson traveled to Kodiak, Alaska to attend the Pandalid Shrimp Workshop.

15-24 - Sus Kato, Leader of the Fisheries Development Investigation, participated in the first leg of Cruise No. 7902FL, on the Spanish research/fishing vessel Freire Lopez, boarding the vessel in San Diego on February 15 and returning from San Pedro on February 24.

20-21 - Ueber traveled to southern California at the request of Sea Grant to discuss the Groundfish Management Plan with fishermen. Meetings werre held at the Southwest Region (45 attendees); Santa Barbara (25 attendees); and Morro Bay (50 attendees).

22 - Center Director Izadore Barrett, Center Director, visited the Tiburon Laboratory and met with Abramson, Dr. William H. Lenarz, and Ueber to discuss the Groundfish Management Plan. Barrett also met with Whipple to discuss a proposal for Marine Sanctuaries Act Funding.

February 27 - March 1 - Abramson traveled to Washington, D.C. to attend the Workshop on NMFS Marine Recreational Fisheries (MRF) Program.

VISITORS

Honolulu Laboratory

February 1 - Brooks Takenaka, Sea Grant agent on Maui, visited Otsu.

8-9 - Dr. Lamarr B. Trott, Resources Assessment Division, NMFS, Washington, D.C. who was in Hawaii for the University of Hawaii Sea Grant Site Visit, had meetings with Shomura and other Laboratory personnel. Dr. Trott also spoke to the entire staff at a general staff meeting.

9 - Walter Gandy, NMFS Fisheries Engineering Laboratory, Bay St. Louis, Mississippi; Jacqueline Jennings, SWFC, La Jolla; and James Clements, SCI Systems, Huntsville, Alabama.

15 - Dr. John J. Magnuson, University of Wisconsin.

23 - Otsu and Hida provided a tour of the Kewalo facility for students of the Hokkaido University (Japan) who were visiting Honolulu on the research vessel Hokusei Maru.

La Jolla Laboratory

Week of
February 5 - Dr. Angel Guerra and Sr. German Perex Gandaras, Spanish scientists from the Instituto de Investigaciones Pesqueras, visited Dr. Gary Stauffer, Fishery Biologist, in connection with the squid survey cruise.

- Mike Fahey from the NMFS Laboratory at Sandy Hook, New Jersey, visited Dr. E. Ahlstrom and Dr. H.G. Moser of the Multispecies Taxonomy Program.

19 - John Radovich of the California Department of Fish and Game visited Dr. John Hunter, Leader of the Larval Fishes, Coastal East Pacific Program, to explore the possibilities of culturing white sea bass and other recreational fishes at the Center.

Pacific Environmental Group

February 7 - Roger Green, NMFS, Tiburon, CA.

Tiburon Laboratory

February 2 - Roy Everingham, Everingham Brothers Bait Company, San Diego, CA.

8 - Steve Settle, commercial fisherman, Albion, CA.

10 - Dr. Frederick Weiss, Research Chemist, Shell Development, Houston, TX.

16 - Robert B. Agness, Alameda NAS, Alameda, CA.

- Jim Hannon, Sippican Corp., Marion, MA.

- Lt. B.E. May, Alameda NAS, Alameda, CA.

- Douglas McLain, NMFS, Pacific Environmental Group, Monterey, CA.

- Barre Shepp, Alameda NAS, Alameda, CA.

22 - Izadore Barrett, Center, Director, La Jolla, CA.

- Charles T. Mitchell, Marine Biological Consultants, Inc., Costa Mesa, CA.

23 - Richard Charter, Nick Iorio, and Fred Kellenberger of the Southwest Fisheries Center, La Jolla, CA.

- George Liao, NMFS, Honolulu Laboratory, Honolulu, HI.

- Woodrow W. Ulm, Malabar Fisheries, Monte Rio, CA.

PERSONNEL ACTIONS

Honolulu Laboratory

February 2 - Henry M. Kishinami, Biological Aid (Fisheries) - Temporary Appointment.

12 - Lisa Ann Katekaru, Computer Aid - Temporary Appointment.

- Francine E. Yagawa, Computer Aid - Temporary Appointment.

- Brent M. Miyamoto, Computer Aid - Temporary Appointment.

13 - Jeffrey J. Polovina, Statistician - Temporary Appointment.

23 - Glenn R. Higashi, Biological Technician (Fisheries) - Resignation.

La Jolla Laboratory

January 28 - Lonnie Dick, Biological Aid - Temporary Appointment.

February 5 - Dawn Wolfsberg, Student Assistant - Temporary Appointment.

11 - Frank Iorio, Computer Programmer - Promotion.

- Al Coan, Mathematician - Promotion.

- Gary Sakagawa, Supervisory Fishery Biologist - Promotion to Division Chief.

- Ray Stives, Biological Technician - Temporary Appointment.

- James Zweifel, Mathematician - Promotion.

Tiburon Laboratory

February 25 - Brian M. Jarvis - Promotion.

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